MKEC ENGINEERING CONSULTANTS, INC.
411 North Webb Road
Wichita, Kansas 67206
316-684-9600 FAX 316-684-5100

LETTER OF TRANSMITTAL

PROJECT: Ellson Court Addition

PROJECT NO: 00168-114

DATE: August 22, 2000

TO: Vicky Huang, P.E.
City of Wichita Engineering
455 N. Main - 7th Floor
Wichita, KS 67202

We are sending you the following items: __X__ Attached
_____ Under separate cover
__X__ Via ___Mailed___

_____ Drawings _____ Specifications _____ Computer Disk(s)

__X__ Maps _____ Petitions __X__ Other

COMMENTS: Enclosed are the Drainage Plan, supporting documents and the Drainage & Utility Plan. Disregard the documents sent to you on August 21st. Sorry for the inconvenience.

_____ For Your Approval _____ As Requested

__X__ For Your Use _____ For Your Files

_____ Approved As Noted _____ For Review and Comment

REMARKS:

RECEIVED
AUG 22 2000
CITY ENGINEERING

Signed: _____
Aaron Hale, P.E.

K:\WP\WORDPERFECT-TRANS.wpd

Drainage Plan
Ellson Court Addition
Pre-Development vs. Post-Development Runoff

Existing Conditions

The existing site, of the proposed Ellson Court Addition, contains 2.32 acres of vacant land. The existing soil is Rd – Rose Hill/silty clay with a hydrological soil group D. The runoff length for the site is 650 feet at a slope of 1.7 %.

Using the TR-20 computer model, MKEC determined the pre-developed runoff from the Ellson Court Addition (listed in Table 2) for the 2, 5, 10, and 100-year events, along with the offsite runoff (through the Fountains Addition, New Life Christian Church, and SE of Fountains Addition).

The lake storage data and drainage area for the Fountains Addition came from POE & Associates design. MKEC verified the drainage area and then developed the runoff curve number and time of concentration. Table 1 compares the values used by POE & Associates and MKEC Engineering Consultants. The lake discharge rating comes from HY-8 culvert analysis. The existing discharges from the pond and surrounding areas, and the maximum storage elevations for the pond as calculated by MKEC for the 2, 5, 10, and 100-year events are listed in Table 2. POE & Associates had calculated a discharge of 186 cfs and water surface elevation of 1368.41 for a 100-year (6-hr) event using HEC-1.

Table 1

Discharge values from	*Storage*	*Da*		*Tc*
Fountains Addn.	*Ac-Ft*	*Acres*	*CN*	*Hours*
POE & Assoc.	5.82	60.1	81.7	0.32
MKEC	5.82	60.1	90.3	0.65

Table 2

Existing runoff	*2-Yr*	*5-Yr*	*10-Yr*	*100-Yr*	*Major July Storm*
Discharge from Pond (cfs)	54	95	121	217	
Pond Elevation (ft)	1367.43	1367.98	1368.27	1369.37	
Runoff from Church (cfs)	7	11	13	21	
Runoff form Ellson Court (cfs)	3	5	7	11	
Runoff from SE of Ellson Court (cfs)	14	23	28	49	
Comb. Runoff at Ellson St.	67	118	151	275	
Water elevation at Ellson St. (Street El. = 1364.53)	1360.43	1361.22	1361.68	1363.22	1366.53*

*According to an observation made by a resident of the Fountains, Unconfirmed reports of 4" in 1 ½ hours.

The discharge from Fountains Addition Pond during the larger storms will be slightly lower than the rates shown in the TR-20 report. The weir opening above the 1368.4 elevation becomes narrower as the weir becomes part of the wing-wall. The weir structure will act more as an inlet as the water forms around the "wing-walls" of the box (as the pond reaches higher elevations) and drops into the opening. At this point velocity losses will occur.

The New Life Christian Church contributes approximately 4.1 acres of runoff into the basin. The curve number is 85, from which about 25% of the area is impervious. The time of concentration equals 0.47 hours. The offsite runoff from the church lot is shown in Table 2.

Proposed Conditions from Ellson Court Addition

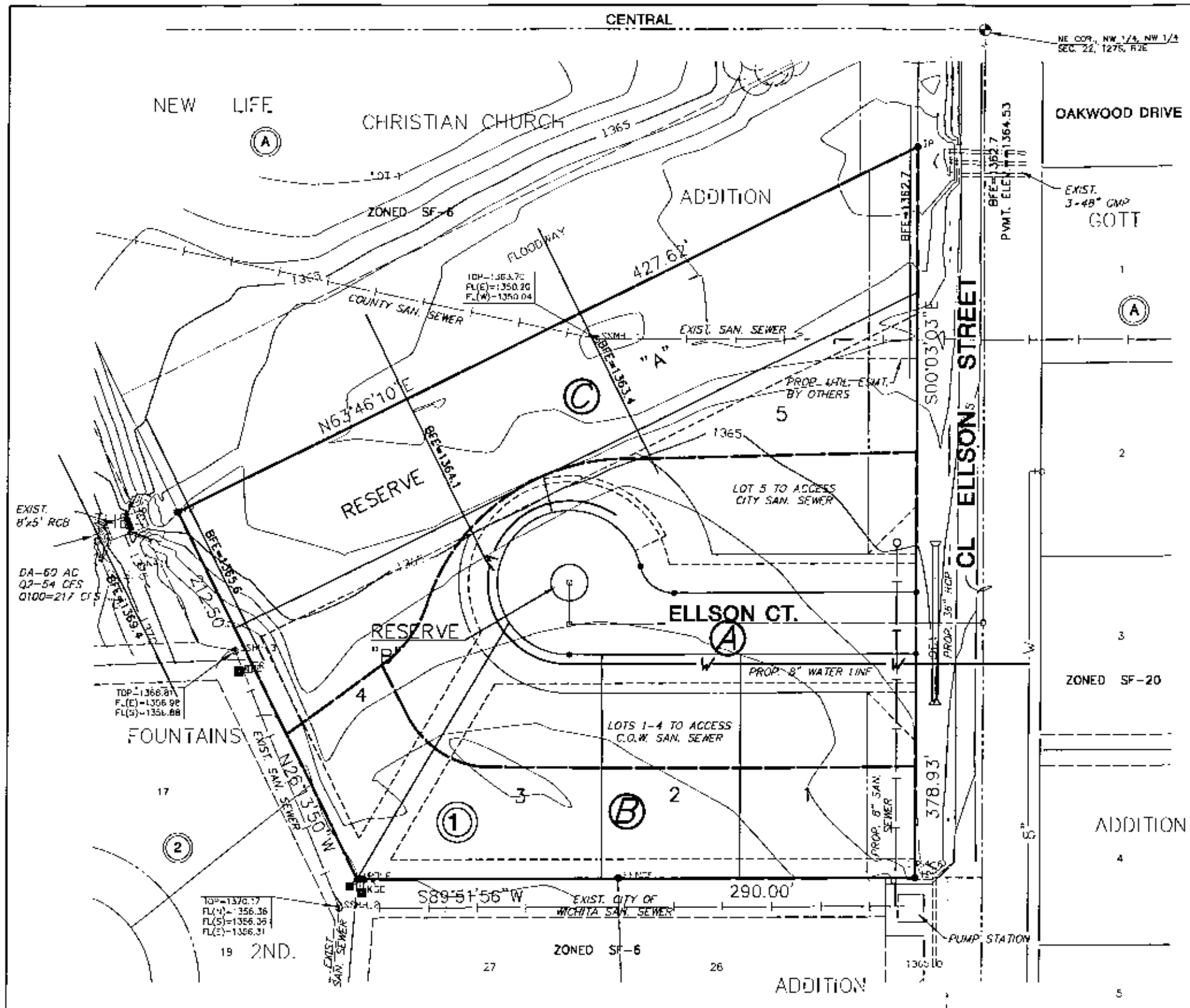
The length of runoff remained the same for the existing site under proposed conditions (650 feet), along with the slope (1.7 %). The coefficients increased due to the increase in impervious area. Using the TR-20 computer model, MKEC determined the post-development runoff from the site (listed in Table 3) for the 2, 5, 10, and 100-year events.

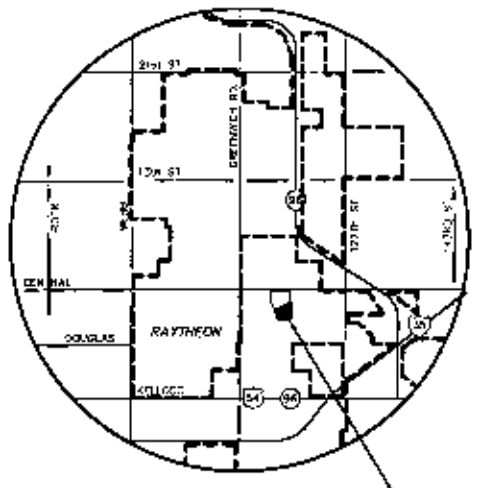
Table 3

Ellson Court Addition	2-Yr	5-Yr	10-Yr	100-Yr
Post-Developed (cfs)	5	8	9	15

The discharges from the TR-20 run were placed into a HEC-RAS model to develop water surface elevations in the ditch channel. The HEC-RAS report plan #1 contains the water surface elevations and discharges.

A recent intense rainstorm (July 2000) produced flooding over Ellson Street. A nearby resident reported the water had been two feet deep on Ellson Street during this rainstorm, "bumper high." We placed this information into the modeling program (HEC-RAS) as plan #2 to use as a comparison to plan #1. (Plan #1 modeled the 2 through 100-year event). The two feet of high water over Ellson Street has no effect on the pond elevation in The Fountains Addition. Minimum pads for Ellson Court have been set according to this recorded event.





VICINITY MAP

LEGEND

- LP LIGHT POLE
- GM GAS METER
- PP POWER POLE
- TREE
- TR TELEPHONE RISER
- IP IRON PIN
- IRON PIN
- FENCE
- STUMP

BENCHMARKS

BM#1 CHISELED " " ON TOP OF CURB AT WEST END OF S.W. RETURN CENTRAL AVENUE AND ELLSON STREET.

ELEV. = 1387.86

SCALE: 1"=30'

LOT	BLOCK	MIN. PAD (USGS DATUM) LOWEST OPENING
4	1	1368.5
5	1	1368.5

DRAINAGE AND UTILITY PLAN

ELLSON COURT ADDITION

OWNER: NEW LIFE CHRISTIAN CHURCH, 11441 E. CENTRAL, WICHITA, KS. 67206 DEVELOPER: SNODGRASS DEVELOPMENT, 2400 N. WOODLAWN, WICHITA, KS. 67220 DATE: JUNE 2000

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316-684-0000

Replacing w/ existing 3-48" cmf

1

CURRENT DATE: 07-13-2000　FILE DATE: 07-13-2000
CURRENT TIME: 16:38:47　FILE NAME: ECCMP

FHWA CULVERT ANALYSIS
HY-8, VERSION 4.1

C D N O	SITE DATA: INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	1358.29	1357.22	40.01	3 CSP	4.00	4.00	.024	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (CFS)　FILE: ECCMP　DATE: 07-13-2000

ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
1359.50	0	0	0	0	0	0	0	0	1
1359.68	25	25	0	0	0	0	0	0	1
1359.79	50	50	0	0	0	0	0	0	1
1360.27	75	75	0	0	0	0	0	0	1
1360.66	100	100	0	0	0	0	0	0	1
1361.01	125	125	0	0	0	0	0	0	1
1361.31	150	150	0	0	0	0	0	0	1
1361.60	175	175	0	0	0	0	0	0	1
1361.88	200	200	0	0	0	0	0	0	1
1362.18	225	225	0	0	0	0	0	0	1
1362.24	230	230	0	0	0	0	0	0	1
1364.57	380	380	0	0	0	0	0	0	OVERTOPPING

SUMMARY OF ITERATIVE SOLUTION ERRORS　FILE: ECCMP　DATE: 07-13-2000

HEAD ELEV (FT)	HEAD ERROR (FT)	TOTAL FLOW (CFS)	FLOW ERROR (CFS)	% FLOW ERROR
1359.50	0.00	0	0	0.00
1359.68	0.00	25	0	0.00
1359.79	0.00	50	0	0.00
1360.27	0.00	75	0	0.00
1360.66	0.00	100	0	0.00
1361.01	0.00	125	0	0.00
1361.31	0.00	150	0	0.00
1361.60	0.00	175	0	0.00
1361.88	0.00	200	0	0.00
1362.18	0.00	225	0	0.00
1362.24	0.00	230	0	0.00

<1> TOLERANCE (FT) = 0.010　<2> TOLERANCE (%) = 1.000

2

CURRENT DATE: 07-13-2000　FILE DATE: 07-13-2000
CURRENT TIME: 16:36:41　FILE NAME: ECCMP

PERFORMANCE CURVE FOR CULVERT # 1 - 3 (4 BY 4) CSP

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRITICAL DEPTH (ft)	OUTLET VEL. (fps)	OUTLET DEPTH (ft)	TAILWATER VEL. (fps)	TAILWATER DEPTH (ft)
0	1359.50	0.00	1.21	3-NF	0.00	0.00	0.00	0.00	0.00	2.29
25	1359.68	0.92	1.19	3-M1t	0.67	0.81	1.13	2.28	0.00	2.29
50	1359.79	1.50	1.50	1-S2n	0.96	1.20	7.12	0.96	0.00	2.29
75	1360.27	1.98	1.98	1-S2n	1.20	1.47	7.83	1.21	0.00	2.29
100	1360.66	2.37	2.37	1-S2n	1.39	1.71	8.59	1.39	0.00	2.29
125	1361.01	2.72	2.72	1-S2n	1.57	1.92	9.09	1.57	0.00	2.29
150	1361.31	3.02	3.02	1-S2n	1.74	2.11	9.37	1.76	0.00	2.29
175	1361.60	3.31	3.31	1-S2n	1.90	2.29	9.75	1.92	0.00	2.29
200	1361.88	3.59	3.59	1-S2n	2.05	2.46	10.07	2.08	0.00	2.29
225	1362.18	3.89	3.89	1-S2n	2.21	2.61	10.37	2.24	0.00	2.29
230	1362.24	3.95	3.95	1-S2n	2.24	2.64	10.43	2.27	0.00	2.29

El. inlet face invert 1358.29 ft　El. outlet invert 1357.22 ft
El. inlet throat invert 0.00 ft　El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **************

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1358.29
OUTLET STATION (FT)	40.00
OUTLET ELEVATION (FT)	1357.22
NUMBER OF BARRELS	3
SLOPE (V-FT/H-FT)	0.0268
CULVERT LENGTH ALONG SLOPE (FT)	40.01

***** CULVERT DATA SUMMARY ************************

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	4.00 FT
BARREL MATERIAL	CORRUGATED STEEL
BARREL MANNING'S N	0.024
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	BEVELED EDGE (1:1)
INLET DEPRESSION	NONE

CURRENT DATE: 07-13-2000
CURRENT TIME: 16:38:41

FILE DATE: 07-13-2000
FILE NAME: ECCMP

TAILWATER

CONSTANT WATER SURFACE ELEVATION
1359.50

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	26.00

***** USER DEFINED ROADWAY PROFILE

CROSS-SECTION COORD. NO.	X (FT)	Y (FT)
1	0.00	1365.26
2	120.00	1364.53
3	422.00	1365.93

1

**********80-80 LIST OF INPUT DATA FOR TR-20 HYDROLOGY**********

```
JOB TR-20                                                SUMMARY
TITLE 003 POND @ ELLSON COURT ADDITION NGG 2,5,10,100-YR EVENTS
TITLE  FAA TC 28SEP99 PRELIM. EVALUATIONS K=484 FILENAME EC.T20
 4 DIMHYD              0.02                                          484
 8          .000       .030        .100        .190        .310
 8          .470       .660        .820        .930        .990
 8         1.000       .990        .930        .860        .780
 8          .680       .560        .460        .390        .330
 8          .280       .241        .207        .174        .147
 8          .126       .107        .091        .077        .066
 8          .055       .047        .040        .034        .029
 8          .025       .021        .018        .015        .013
 8          .011       .009        .008        .007        .006
 8          .005       .004        .003        .002        .001
 8          .000       .000        .000        .000        .000
 9 ENDTBL
 5 RAINFL 7            0.08333                                       6-HR M&L
 8          0.0000     0.0033      0.0066      0.0099      0.0132
 8          0.0166     0.0198      0.0248      0.0296      0.0346
 8          0.0404     0.0463      0.0522      0.0590      0.0658
 8          0.0727     0.0796      0.0864      0.0933      0.1136
 8          0.1340     0.1572      0.1832      0.2124      0.2473
 8          0.2850     0.3400      0.4464      0.6034      0.6752
 8          0.7220     0.7409      0.7598      0.7758      0.7919
 8          0.8072     0.8224      0.8310      0.8396      0.8468
 8          0.8540     0.8628      0.8714      0.8773      0.8832
 8          0.8890     0.8939      0.8988      0.9038      0.9086
 8          0.9136     0.9184      0.9233      0.9282      0.9332
 8          0.9380     0.9429      0.9478      0.9527      0.9576
 8          0.9626     0.9664      0.9704      0.9742      0.9782
 8          0.9821     0.9860      0.9884      0.9906      0.9930
 8          0.9954     0.9976      1.0000      1.0000      1.0000
 9 ENDTBL
 5 RAINFL 8            0.5                                           24-HRSCS
 8          .000       .002        .005        .009        .013      ZONE 5
 8          .018       .023        .029        .035        .042
 8          .050       .059        .068        .078        .089
 8          .101       .114        .128        .144        .162
 8          .183       .208        .244        .339        .723
 8          .773       .802        .825        .844        .861
 8          .876       .890        .903        .914        .924
 8          .934       .943        .951        .959        .966
 8          .972       .977        .982        .986        .990
 8          .993       .996        .998       1.000       1.000
 9 ENDTBL
 3 STRUCT     10                                                     Fount Po
1
```

```
**********80-80 LIST OF INPUT DATA (CONTINUED)**********

 8                          1364.4      0.0         0.0
 8                          1365.4      12.05       1.12
 8                          1366.4      24.34       2.45
 8                          1367.4      57.46       4.02
 8                          1368.4      139.39      5.83
 8                          1369.4      263.57      7.91
 9 ENDTBL
 6 RUNOFF 1 001       2 0.0939        90.3        0.6492                1 FOUNT
 6 RESVOR 2    10 2   3 1364.4                                          1 FOUNT PO
 6 RUNOFF 1 015       1 0.0064        85.0        0.4707                1 CHURCH
 6 RUNOFF 1 020       2 0.0036        80.0        0.4279                1 EC PRE
 6 RUNOFF 1 025       4 0.0036        67.0        0.3160                1 EC POST
 6 RUNOFF 1 027       5 0.0204        80.0        0.6742                1 SE FOUNT
 6 ADDHYD 4 030    1 4 6
 6 ADDHYD 4 035    5 6 7
 6 ADDHYD 4 040    3 7 1
   ENDATA
 7 INCREM 6           0.0833
 7 COMPUT 7 001   040 0.0          2.52        1.0         7 2  11  01 2-YR 6-H
   ENDCMP 1
 7 COMPUT 7 001   040 0.0          3.42        1.0         7 2  12  02 5-YR 6-H
   ENDCMP 1
 7 COMPUT 7 001   040 0.0          4.02        1.0         7 2  13  03 10-YR 6-
   ENDCMP 1
 7 COMPUT 7 001   040 0.0          5.94        1.0         7 2  16  06 100-YR 6
   ENDCMP 1
 7 COMPUT 7 001   040 0.0          3.48        1.0         2 2  21  01 2-YR TYP
   ENDCMP 1
 7 COMPUT 7 001   040 0.0          4.55        1.0         2 2  22  02 5-YR TYP
   ENDCMP 1
 7 COMPUT 7 001   040 0.0          5.25        1.0         2 2  23  03 10-YR TY
   ENDCMP 1
 7 COMPUT 7 001   040 0.0          7.80        1.0         2 2  26  06 100-YR T
   ENDCMP 1
 7 COMPUT 7 001   040 0.0          3.48        1.0         8 2  41  01 2-YR ZON
   ENDCMP 1
 7 COMPUT 7 001   040 0.0          4.55        1.0         8 2  42  02 5-YR ZON
   ENDCMP 1
 7 COMPUT 7 001   040 0.0          5.25        1.0         8 2  43  03 10-YR ZO
   ENDCMP 1
 7 COMPUT 7 001   040 0.0          7.80        1.0         8 2  46  06 100-YR Z
   ENDCMP 1
   ENDJOB 2

**********END OF 80-80 LIST**********
1
TR20 ------------------------------------------------------------------------
            POND @ ELLSON COURT ADDITION NGG 2,5,10,100-YR EVENTS       VERSION
08/14/**     TC 28SEP99 PRELIM. EVALUATIONS K=484 FILENAME EC.T20       10/01/90
10:19:11                          PASS   1                             PAGE   1

            COMPUTED PEAK RATE FACTOR =   484.00
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EXECUTIVE CONTROL INCREM    MAIN TIME INCREMENT =    .08 HOURS


EXECUTIVE CONTROL COMPUT    FROM XSECTION   1  TO XSECTION  40        2-YR 6-H
   STARTING TIME =   .00          RAIN DEPTH =  2.52        RAIN DURATION=  1.00
   ANT. MOIST. COND. = 2          MAIN TIME INCREMENT =    .08 HOURS
   ALTERNATE NO.=11               STORM NO.= 1              RAIN TABLE NO.= 7

*** WARNING - XSECTION  20, HYDROGRAPH VOLUME TRUNCATED AT      0 CFS
                           ( 21. % OF MAX. HYDROGRAPH COORDINATE)
                           MAIN TIME INCREMENT TOO SMALL.                  ***

*** WARNING - XSECTION  25, HYDROGRAPH VOLUME TRUNCATED AT      0 CFS
                           ( 12. % OF MAX. HYDROGRAPH COORDINATE)
                           MAIN TIME INCREMENT TOO SMALL.                  ***


EXECUTIVE CONTROL ENDCMP    COMPUTATIONS COMPLETED FOR PASS   1


EXECUTIVE CONTROL COMPUT    FROM XSECTION   1  TO XSECTION  40        5-YR 6-H
   STARTING TIME =   .00          RAIN DEPTH =  3.42        RAIN DURATION=  1.00
   ANT. MOIST. COND. = 2          MAIN TIME INCREMENT =    .08 HOURS
   ALTERNATE NO.=12               STORM NO.= 2              RAIN TABLE NO.= 7

*** WARNING - XSECTION  20, HYDROGRAPH VOLUME TRUNCATED AT      0 CFS
                           ( 11. % OF MAX. HYDROGRAPH COORDINATE)
                           MAIN TIME INCREMENT TOO SMALL.                  ***


EXECUTIVE CONTROL ENDCMP    COMPUTATIONS COMPLETED FOR PASS   2


EXECUTIVE CONTROL COMPUT    FROM XSECTION   1  TO XSECTION  40       10-YR 6-
   STARTING TIME =   .00          RAIN DEPTH =  4.02        RAIN DURATION=  1.00
   ANT. MOIST. COND. = 2          MAIN TIME INCREMENT =    .08 HOURS
   ALTERNATE NO.=13               STORM NO.= 3              RAIN TABLE NO.= 7
1
TR20 ---------------------------------------------------------------------------
            POND @ ELLSON COURT ADDITION NGG 2,5,10,100-YR EVENTS          VERSION
08/14/**     TC 28SEP99 PRELIM. EVALUATIONS K=484 FILENAME EC.T20         10/01/90
10:19:11                    PASS   4                                      PAGE   2


EXECUTIVE CONTROL ENDCMP    COMPUTATIONS COMPLETED FOR PASS   3


EXECUTIVE CONTROL COMPUT    FROM XSECTION   1  TO XSECTION  40       100-YR 6
   STARTING TIME =   .00          RAIN DEPTH =  5.94        RAIN DURATION=  1.00
   ANT. MOIST. COND. = 2          MAIN TIME INCREMENT =    .08 HOURS
   ALTERNATE NO.=16               STORM NO.= 6              RAIN TABLE NO.= 7


EXECUTIVE CONTROL ENDCMP    COMPUTATIONS COMPLETED FOR PASS   4
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EXECUTIVE CONTROL COMPUT    FROM XSECTION   1  TO XSECTION  40        2-YR TYP
   STARTING TIME =   .00          RAIN DEPTH =  3.48        RAIN DURATION=  1.00
   ANT. MOIST. COND. = 2          MAIN TIME INCREMENT =    .08 HOURS
   ALTERNATE NO.=21               STORM NO.= 1              RAIN TABLE NO.= 2

*** WARNING - XSECTION  20, HYDROGRAPH VOLUME TRUNCATED AT      0 CFS
                          ( 13. % OF MAX. HYDROGRAPH COORDINATE)
                          MAIN TIME INCREMENT TOO SMALL.                    ***


EXECUTIVE CONTROL ENDCMP    COMPUTATIONS COMPLETED FOR PASS   5


EXECUTIVE CONTROL COMPUT    FROM XSECTION   1  TO XSECTION  40        5-YR TYP
   STARTING TIME =   .00          RAIN DEPTH =  4.55        RAIN DURATION=  1.00
   ANT. MOIST. COND. = 2          MAIN TIME INCREMENT =    .08 HOURS
   ALTERNATE NO.=22               STORM NO.= 2              RAIN TABLE NO.= 2


EXECUTIVE CONTROL ENDCMP    COMPUTATIONS COMPLETED FOR PASS   6


EXECUTIVE CONTROL COMPUT    FROM XSECTION   1  TO XSECTION  40        10-YR TY
   STARTING TIME =   .00          RAIN DEPTH =  5.25        RAIN DURATION=  1.00
   ANT. MOIST. COND. = 2          MAIN TIME INCREMENT =    .08 HOURS
   ALTERNATE NO.=23               STORM NO.= 3              RAIN TABLE NO.= 2
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EXECUTIVE CONTROL ENDCMP    COMPUTATIONS COMPLETED FOR PASS   7


EXECUTIVE CONTROL COMPUT    FROM XSECTION   1  TO XSECTION  40        100-YR T
   STARTING TIME =   .00          RAIN DEPTH =  7.80        RAIN DURATION=  1.00
   ANT. MOIST. COND. = 2          MAIN TIME INCREMENT =    .08 HOURS
   ALTERNATE NO.=26               STORM NO.= 6              RAIN TABLE NO.= 2


EXECUTIVE CONTROL ENDCMP    COMPUTATIONS COMPLETED FOR PASS   8


EXECUTIVE CONTROL COMPUT    FROM XSECTION   1  TO XSECTION  40        2-YR ZON
   STARTING TIME =   .00          RAIN DEPTH =  3.48        RAIN DURATION=  1.00
   ANT. MOIST. COND. = 2          MAIN TIME INCREMENT =    .08 HOURS
   ALTERNATE NO.=41               STORM NO.= 1              RAIN TABLE NO.= 8

*** WARNING - XSECTION  20, HYDROGRAPH VOLUME TRUNCATED AT      0 CFS
                          ( 15. % OF MAX. HYDROGRAPH COORDINATE)
                          MAIN TIME INCREMENT TOO SMALL.                    ***
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*** WARNING - XSECTION  25, HYDROGRAPH VOLUME TRUNCATED AT      0 CFS
                          ( 11. % OF MAX. HYDROGRAPH COORDINATE)
                         MAIN TIME INCREMENT TOO SMALL.                  ***


EXECUTIVE CONTROL ENDCMP    COMPUTATIONS COMPLETED FOR PASS   9


EXECUTIVE CONTROL COMPUT    FROM XSECTION   1  TO XSECTION  40        5-YR ZON
   STARTING TIME =   .00          RAIN DEPTH =  4.55       RAIN DURATION=  1.00
   ANT. MOIST. COND. = 2          MAIN TIME INCREMENT =    .08 HOURS
   ALTERNATE NO.=42               STORM NO.= 2             RAIN TABLE NO.= 8


EXECUTIVE CONTROL ENDCMP    COMPUTATIONS COMPLETED FOR PASS  10


EXECUTIVE CONTROL COMPUT    FROM XSECTION   1  TO XSECTION  40        10-YR ZO
   STARTING TIME =   .00          RAIN DEPTH =  5.25       RAIN DURATION=  1.00
   ANT. MOIST. COND. = 2          MAIN TIME INCREMENT =    .08 HOURS
   ALTERNATE NO.=43               STORM NO.= 3             RAIN TABLE NO.= 8
1
TR20 ----------------------------------------------------------------------
          POND @ ELLSON COURT ADDITION NGG 2,5,10,100-YR EVENTS       VERSION
08/14/**    TC 28SEP99 PRELIM. EVALUATIONS K=484 FILENAME EC.T20      10/01/90
10:19:11                        PASS  12                               PAGE   4


EXECUTIVE CONTROL ENDCMP    COMPUTATIONS COMPLETED FOR PASS  11


EXECUTIVE CONTROL COMPUT    FROM XSECTION   1  TO XSECTION  40        100-YR Z
   STARTING TIME =   .00          RAIN DEPTH =  7.80       RAIN DURATION=  1.00
   ANT. MOIST. COND. = 2          MAIN TIME INCREMENT =    .08 HOURS
   ALTERNATE NO.=46               STORM NO.= 6             RAIN TABLE NO.= 8


EXECUTIVE CONTROL ENDCMP    COMPUTATIONS COMPLETED FOR PASS  12
1
TR20 ----------------------------------------------------------------------
          POND @ ELLSON COURT ADDITION NGG 2,5,10,100-YR EVENTS       VERSION
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                          SUMMARY TABLE 1
                          ---------------

   SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
   A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH    T-TRUNCATED HYDROGRAPH    R-RISING TRUNCATED HYDROGRAPH

XSECTION/  STANDARD                                        PEAK DISCHARGE
STRUCTURE   CONTROL     DRAINAGE    RUNOFF    ------------------------------
   ID      OPERATION      AREA      AMOUNT   ELEVATION   TIME      RATE     RATE
```

			(SQ MI)	(IN)	(FT)	(HR)	(CFS)	(CSM)
RAINFALL OF 2.52 inches AND 6.00 hr DURATION, BEGINS AT .0 hrs.								
RAINTABLE NUMBER 7, AMC 2								
MAIN TIME INCREMENT .08 HOURS								
ALTERNATE 11 STORM 1								
XSECTION	1	RUNOFF	.09	1.57	---	2.71	83	922.2
STRUCTURE	10	RESVOR	.09	1.57	1366.86	3.19	40	444.4
XSECTION	15	RUNOFF	.01	1.19	---	2.61	5	500.0
XSECTION	20	RUNOFF	.00	.90	---	2.60T	2T********	
XSECTION	25	RUNOFF	.00	1.33	---	2.51T	4T********	
XSECTION	27	RUNOFF	.02	.90	---	2.77	10	500.0
XSECTION	30	ADDHYD	.01	1.24	---	2.56	9	900.0
XSECTION	35	ADDHYD	.03	1.01	---	2.65	17	566.7
XSECTION	40	ADDHYD	.12	1.43	---	3.10	48	400.0
RAINFALL OF 3.42 inches AND 6.00 hr DURATION, BEGINS AT .0 hrs.								
ALTERNATE 12 STORM 2								
XSECTION	1	RUNOFF	.09	2.40	---	2.70	128	1422.2
STRUCTURE	10	RESVOR	.09	2.40	1367.63	3.06	76	844.4
XSECTION	15	RUNOFF	.01	1.94	---	2.60	9	900.0
XSECTION	20	RUNOFF	.00	1.57	---	2.59T	4T********	
XSECTION	25	RUNOFF	.00	2.11	---	2.50	6 ********	
XSECTION	27	RUNOFF	.02	1.57	---	2.75	17	850.0
XSECTION	30	ADDHYD	.01	2.00	---	2.55	14	1400.0
XSECTION	35	ADDHYD	.03	1.72	---	2.64	29	966.7
XSECTION	40	ADDHYD	.12	2.23	---	3.01	93	775.0
RAINFALL OF 4.02 inches AND 6.00 hr DURATION, BEGINS AT .0 hrs.								
ALTERNATE 13 STORM 3								
XSECTION	1	RUNOFF	.09	2.96	---	2.69	158	1755.6

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SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)

ALTERNATE 13 STORM 3

STRUCTURE	10	RESVOR	.09	2.96	1367.98	3.00	105	1166.7
XSECTION	15	RUNOFF	.01	2.47	---	2.60	11	1100.0
XSECTION	20	RUNOFF	.00	2.06	---	2.58	5	********
XSECTION	25	RUNOFF	.00	2.65	---	2.50	8	********
XSECTION	27	RUNOFF	.02	2.06	---	2.74	23	1150.0
XSECTION	30	ADDHYD	.01	2.54	---	2.54	18	1800.0
XSECTION	35	ADDHYD	.03	2.22	---	2.64	38	1266.7
XSECTION	40	ADDHYD	.12	2.78	---	2.95	130	1083.3

RAINFALL OF 5.94 inches AND 6.00 hr DURATION, BEGINS AT .0 hrs.

ALTERNATE 16 STORM 6

XSECTION	1	RUNOFF	.09	4.82	---	2.69	256	2844.4
STRUCTURE	10	RESVOR	.09	4.82	1368.90	2.91	201	2233.3
XSECTION	15	RUNOFF	.01	4.24	---	2.59	19	1900.0
XSECTION	20	RUNOFF	.00	3.72	---	2.57	10	********
XSECTION	25	RUNOFF	.00	4.43	---	2.49	13	********
XSECTION	27	RUNOFF	.02	3.72	---	2.72	42	2100.0
XSECTION	30	ADDHYD	.01	4.31	---	2.54	31	3100.0
XSECTION	35	ADDHYD	.03	3.92	---	2.62	69	2300.0
XSECTION	40	ADDHYD	.12	4.60	---	2.86	252	2100.0

RAINFALL OF 3.48 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.
RAINTABLE NUMBER 2, AMC 2

ALTERNATE 21 STORM 1

XSECTION	1	RUNOFF	.09	2.45	---	12.26	105	1166.7
STRUCTURE	10	RESVOR	.09	2.45	1367.29	12.66	54	600.0
XSECTION	15	RUNOFF	.01	2.00	---	12.17	7	700.0
XSECTION	20	RUNOFF	.00	1.62	---	12.15T	3T	********

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TR20 ----------

POND @ ELLSON COURT ADDITION NGG 2,5,10,100-YR EVENTS VERSION
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SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)

ALTERNATE 21 STORM 1

XSECTION	25	RUNOFF	.00	2.16	---	12.07	5	********
XSECTION	27	RUNOFF	.02	1.62	---	12.30	14	700.0
XSECTION	30	ADDHYD	.01	2.06	---	12.12	12	1200.0
XSECTION	35	ADDHYD	.03	1.76	---	12.20	25	833.3
XSECTION	40	ADDHYD	.12	2.28	---	12.54	67	558.3

RAINFALL OF 4.55 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.

ALTERNATE 22 STORM 2

XSECTION	1	RUNOFF	.09	3.47	---	12.26	146	1622.2
STRUCTURE	10	RESVOR	.09	3.47	1367.86	12.56	95	1055.6
XSECTION	15	RUNOFF	.01	2.95	---	12.16	11	1100.0
XSECTION	20	RUNOFF	.00	2.50	---	12.14	5	********
XSECTION	25	RUNOFF	.00	3.14	---	12.07	8	********
XSECTION	27	RUNOFF	.02	2.50	---	12.29	23	1150.0
XSECTION	30	ADDHYD	.01	3.02	---	12.11	18	1800.0
XSECTION	35	ADDHYD	.03	2.67	---	12.19	38	1266.7
XSECTION	40	ADDHYD	.12	3.27	---	12.51	118	983.3

RAINFALL OF 5.25 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.

ALTERNATE 23 STORM 3

XSECTION	1	RUNOFF	.09	4.15	---	12.26	174	1933.3
STRUCTURE	10	RESVOR	.09	4.15	1368.18	12.53	121	1344.4
XSECTION	15	RUNOFF	.01	3.60	---	12.16	13	1300.0
XSECTION	20	RUNOFF	.00	3.11	---	12.14	7	********
XSECTION	25	RUNOFF	.00	3.80	---	12.07	9	********
XSECTION	27	RUNOFF	.02	3.11	---	12.29	28	1400.0
XSECTION	30	ADDHYD	.01	3.67	---	12.11	21	2100.0
XSECTION	35	ADDHYD	.03	3.29	---	12.19	46	1533.3

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POND @ ELLSON COURT ADDITION NGG 2,5,10,100-YR EVENTS VERSION

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SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH ,T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)

ALTERNATE 23 STORM 3

XSECTION	40	ADDHYD	.12	3.94	---	12.47	151	1258.3

RAINFALL OF 7.80 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.

ALTERNATE 26 STORM 6

XSECTION	1	RUNOFF	.09	6.63	---	12.25	273	3033.3
STRUCTURE	10	RESVOR	.09	6.63	1369.02	12.46	217	2411.1
XSECTION	15	RUNOFF	.01	6.02	---	12.15	21	2100.0
XSECTION	20	RUNOFF	.00	5.43	---	12.13	11	********
XSECTION	25	RUNOFF	.00	6.25	---	12.07	15	********
XSECTION	27	RUNOFF	.02	5.43	---	12.28	49	2450.0
XSECTION	30	ADDHYD	.01	6.10	---	12.11	35	3500.0
XSECTION	35	ADDHYD	.03	5.65	---	12.19	79	2633.3
XSECTION	40	ADDHYD	.12	6.39	---	12.41	275	2291.7

RAINFALL OF 3.48 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.
RAINTABLE NUMBER 8, AMC 2

ALTERNATE 41 STORM 1

XSECTION	1	RUNOFF	.09	2.46	---	12.17	102	1133.3
STRUCTURE	10	RESVOR	.09	2.46	1367.39	12.54	57	633.3
XSECTION	15	RUNOFF	.01	2.00	---	12.08	7	700.0
XSECTION	20	RUNOFF	.00	1.62	---	12.06T	3T********	
XSECTION	25	RUNOFF	.00	2.16	---	12.01T	4T********	
XSECTION	27	RUNOFF	.02	1.62	---	12.20	14	700.0
XSECTION	30	ADDHYD	.01	2.06	---	12.05	11	1100.0
XSECTION	35	ADDHYD	.03	1.76	---	12.12	24	800.0
XSECTION	40	ADDHYD	.12	2.29	---	12.43	71	591.7

1

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POND @ ELLSON COURT ADDITION NGG 2,5,10,100-YR EVENTS VERSION
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SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)

RAINFALL OF 4.55 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.

ALTERNATE 42 STORM 2

XSECTION	1	RUNOFF	.09	3.47	---	12.17	140	1555.6
STRUCTURE	10	RESVOR	.09	3.47	1367.92	12.45	100	1111.1
XSECTION	15	RUNOFF	.01	2.95	---	12.08	10	1000.0
XSECTION	20	RUNOFF	.00	2.50	---	12.06	5	********
XSECTION	25	RUNOFF	.00	3.14	---	12.01	6	********
XSECTION	27	RUNOFF	.02	2.50	---	12.19	22	1100.0
XSECTION	30	ADDHYD	.01	3.02	---	12.05	16	1600.0
XSECTION	35	ADDHYD	.03	2.67	---	12.12	37	1233.3
XSECTION	40	ADDHYD	.12	3.28	---	12.39	124	1033.3

RAINFALL OF 5.25 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.

ALTERNATE 43 STORM 3

XSECTION	1	RUNOFF	.09	4.14	---	12.17	166	1844.4
STRUCTURE	10	RESVOR	.09	4.14	1368.22	12.42	125	1388.9
XSECTION	15	RUNOFF	.01	3.60	---	12.08	12	1200.0
XSECTION	20	RUNOFF	.00	3.11	---	12.06	6	********
XSECTION	25	RUNOFF	.00	3.80	---	12.01	8	********
XSECTION	27	RUNOFF	.02	3.11	---	12.19	28	1400.0
XSECTION	30	ADDHYD	.01	3.67	---	12.05	19	1900.0
XSECTION	35	ADDHYD	.03	3.29	---	12.12	45	1500.0
XSECTION	40	ADDHYD	.12	3.94	---	12.35	157	1308.3

1

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POND @ ELLSON COURT ADDITION NGG 2,5,10,100-YR EVENTS VERSION

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SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)

RAINFALL OF 7.80 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.

ALTERNATE 46 STORM 6

XSECTION	1	RUNOFF	.09	6.64	---	12.17	262	2911.1
STRUCTURE	10	RESVOR	.09	6.64	1369.05	12.35	220	2444.4
XSECTION	15	RUNOFF	.01	6.01	---	12.08	19	1900.0
XSECTION	20	RUNOFF	.00	5.43	---	12.06	10	********

```
XSECTION  25  RUNOFF      .00     6.25          ---     12.00        12 ********

XSECTION  27  RUNOFF      .02     5.44          ---     12.19        48   2400.0
XSECTION  30  ADDHYD      .01     6.10          ---     12.05        31   3100.0
XSECTION  35  ADDHYD      .03     5.65          ---     12.12        76   2533.3
XSECTION  40  ADDHYD      .12     6.40          ---     12.30       280   2333.3
1
TR20 ------------------------------------------------------------------------------
          POND 8 ELLSON COURT ADDITION NGG 2,5,10,100-YR EVENTS          VERSION
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SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES

XSECTION/ STRUCTURE ID		DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2	3	6
STRUCTURE 10		.09				
ALTERNATE	11		40	*********	*********	*********
ALTERNATE	12		*********	76	*********	*********
ALTERNATE	13		*********	*********	105	*********
ALTERNATE	16		*********	*********	*********	201
ALTERNATE	21		54	*********	*********	*********
ALTERNATE	22		*********	95	*********	*********
ALTERNATE	23		*********	*********	121	*********
ALTERNATE	26		*********	*********	*********	217
ALTERNATE	41		57	*********	*********	*********
ALTERNATE	42		*********	100	*********	*********
ALTERNATE	43		*********	*********	125	*********
ALTERNATE	46		*********	*********	*********	220
XSECTION 1		.09				
ALTERNATE	11		83	*********	*********	*********
ALTERNATE	12		*********	128	*********	*********
ALTERNATE	13		*********	*********	158	*********
ALTERNATE	16		*********	*********	*********	256
ALTERNATE	21		105	*********	*********	*********
ALTERNATE	22		*********	146	*********	*********
ALTERNATE	23		*********	*********	174	*********
ALTERNATE	26		*********	*********	*********	273
ALTERNATE	41		102	*********	*********	*********
ALTERNATE	42		*********	140	*********	*********
ALTERNATE	43		*********	*********	166	*********
ALTERNATE	46		*********	*********	*********	262

XSECTION 15 .01

ALTERNATE	11		5	********* *********	*********
ALTERNATE	12	*********	9	********* *********	*********
ALTERNATE	13	********* *********		11	*********
ALTERNATE	16	********* *********	*********		19
ALTERNATE	21		7	********* *********	*********
ALTERNATE	22	*********	11	*********	*********
ALTERNATE	23	********* *********		13	*********

1

TR20 ----------

POND @ ELLSON COURT ADDITION NGG 2,5,10,100-YR EVENTS VERSION
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SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES

XSECTION/ STRUCTURE ID		DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2	3	6
XSECTION 15 .01						
ALTERNATE	26		*********	********* *********		21
ALTERNATE	41		7	********* *********	*********	*********
ALTERNATE	42		*********	10	********* *********	
ALTERNATE	43		********* *********		12	*********
ALTERNATE	46		********* *********	*********		19
XSECTION 20 .00						
ALTERNATE	11		2	********* *********		*********
ALTERNATE	12		*********	4	*********	*********
ALTERNATE	13		********* *********		5	*********
ALTERNATE	16		********* *********	*********		10
ALTERNATE	21		3	********* *********		*********
ALTERNATE	22		*********	5	*********	*********
ALTERNATE	23		********* *********		7	*********
ALTERNATE	26		********* *********	*********		11
ALTERNATE	41		3	********* *********		*********
ALTERNATE	42		*********	5	*********	*********
ALTERNATE	43		********* *********		6	*********
ALTERNATE	46		********* *********	*********		10
XSECTION 25 .00						
ALTERNATE	11		4	********* *********		*********
ALTERNATE	12		*********	6	*********	*********
ALTERNATE	13		********* *********		8	*********

ALTERNATE	16	*********	*********	*********	13
ALTERNATE	21	5	*********	*********	*********
ALTERNATE	22	*********	8	*********	*********
ALTERNATE	23	*********	*********	9	*********
ALTERNATE	26	*********	*********	*********	15
ALTERNATE	41	4	*********	*********	*********
ALTERNATE	42	*********	6	*********	*********
ALTERNATE	43	*********	*********	8	*********
ALTERNATE	46	*********	*********	*********	12

XSECTION 27 .02

ALTERNATE	11	10	*********	*********	*********
ALTERNATE	12	*********	17	*********	*********

1
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SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2	3	6
XSECTION 27	.02				
ALTERNATE	13	*********	*********	23	*********
ALTERNATE	16	*********	*********	*********	42
ALTERNATE	21	14	*********	*********	*********
ALTERNATE	22	*********	23	*********	*********
ALTERNATE	23	*********	*********	28	*********
ALTERNATE	26	*********	*********	*********	49
ALTERNATE	41	14	*********	*********	*********
ALTERNATE	42	*********	22	*********	*********
ALTERNATE	43	*********	*********	28	*********
ALTERNATE	46	*********	*********	*********	48
XSECTION 30	.01				
ALTERNATE	11	9	*********	*********	*********
ALTERNATE	12	*********	14	*********	*********
ALTERNATE	13	*********	*********	18	*********
ALTERNATE	16	*********	*********	*********	31
ALTERNATE	21	12	*********	*********	*********
ALTERNATE	22	*********	18	*********	*********
ALTERNATE	23	*********	*********	21	*********

ALTERNATE	26	*********	*********	*********	35
ALTERNATE	41		11	********* *********	*********
ALTERNATE	42	*********		16 *********	*********
ALTERNATE	43	*********	*********	19	*********
ALTERNATE	46	*********	*********	*********	31

XSECTION 35 .03

ALTERNATE	11		17	********* *********	*********
ALTERNATE	12	*********		29 *********	*********
ALTERNATE	13	*********	*********	38	*********
ALTERNATE	16	*********	*********	*********	69
ALTERNATE	21		25	********* *********	*********
ALTERNATE	22	*********		38 *********	*********
ALTERNATE	23	*********	*********	46	*********
ALTERNATE	26	*********	*********	*********	79
ALTERNATE	41		24	********* *********	*********
ALTERNATE	42	*********		37 *********	*********

1

SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES

XSECTION/ STRUCTURE ID		DRAINAGE AREA (SQ MI)	STORM NUMBERS..... 1	2	3	6
XSECTION	35	.03				
ALTERNATE	43		*********	*********	45	*********
ALTERNATE	46		*********	*********	*********	76
XSECTION	40	.12				
ALTERNATE	11			48 *********	*********	*********
ALTERNATE	12		*********		93 *********	*********
ALTERNATE	13		*********	*********	130	*********
ALTERNATE	16		*********	*********	*********	252
ALTERNATE	21			67 *********	*********	*********
ALTERNATE	22		*********		118 *********	*********
ALTERNATE	23		*********	*********	151	*********
ALTERNATE	26		*********	*********	*********	275
ALTERNATE	41			71 *********	*********	*********
ALTERNATE	42		*********		124 *********	*********
ALTERNATE	43		*********	*********	157	*********

ALTERNATE 46 ********* ********* ********* 280

END OF 1 JOBS IN THIS RUN
1

SCS TR-20, VERSION 10/01/90
FILES

INPUT = EC.T20
OUTPUT = EC.OUT , DATED 08/14/**,10:19:11

FILES GENERATED - DATED 08/14/**,10:19:11

NONE!

*** TR-20 RUN COMPLETED ***

HEC-RAS Plan: #2 River: North Ditch Reach: 1

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
1	700	54.00	1365.00	1367.47		1367.47	0.000001	0.08	838.70	290.53	0.01
1	700	95.00	1365.00	1368.04		1368.04	0.000002	0.11	806.32	305.83	0.01
1	700	121.00	1365.00	1368.33		1368.33	0.000002	0.13	836.65	312.42	0.01
1	700	217.00	1365.00	1369.37		1369.37	0.000003	0.17	1234.49	335.86	0.02
1	688	54.00	1364.40	1367.00	1367.00	1367.45	0.006158	5.25	10.29	12.02	1.00
1	688	95.00	1364.40	1367.42	1367.42	1367.98	0.004962	6.01	15.79	14.14	1.00
1	688	121.00	1364.40	1367.64	1367.64	1368.27	0.004335	6.36	19.01	15.25	1.00
1	688	217.00	1364.40	1369.31	1365.28	1369.37	0.000258	2.54	222.04	260.69	0.28
1	690	Culvert									
1	647.5	54.00	1364.00	1366.50		1366.50	0.000030	0.30	186.95	152.37	0.04
1	647.5	95.50	1364.00	1366.50		1366.51	0.000093	0.52	186.98	152.39	0.08
1	647.5	121.00	1364.00	1366.50		1366.51	0.000150	0.66	187.02	152.40	0.10
1	647.5	217.00	1364.00	1366.50		1366.52	0.000481	1.19	187.30	152.50	0.17
1	527.3	54.00	1362.80	1366.50		1366.50	0.000002	0.12	476.95	210.07	0.01
1	527.3	95.00	1362.80	1366.50		1366.50	0.000006	0.21	477.11	210.12	0.02
1	527.3	121.00	1362.80	1366.50		1366.50	0.000009	0.27	477.26	210.17	0.03
1	527.3	217.00	1362.80	1366.51		1366.51	0.000030	0.48	479.14	210.46	0.05
1	400	54.00	1362.10	1366.50		1366.50	0.000001	0.09	622.66	240.59	0.01
1	400	95.00	1362.10	1366.50		1366.50	0.000003	0.15	622.78	240.64	0.02
1	400	121.00	1362.10	1366.50		1366.50	0.000004	0.21	622.90	240.69	0.02
1	400	217.00	1362.10	1366.51		1366.51	0.000014	0.37	623.62	240.90	0.03
1	200	57.00	1356.40	1366.50	1359.18	1366.50	0.000000	0.07	881.77	228.00	0.01
1	200	100.00	1356.40	1366.50	1359.53	1366.50	0.000001	0.11	881.58	228.00	0.01
1	200	128.00	1356.40	1366.50	1359.72	1366.50	0.000002	0.16	881.94	228.00	0.01
1	200	232.00	1356.40	1366.50	1360.35	1366.51	0.000006	0.20	882.52	228.00	0.02
1	190	Culvert									
1	180	57.00	1357.20	1366.50		1366.50	0.000000	0.05	1155.17	228.00	0.00
1	180	100.00	1357.20	1366.50		1366.50	0.000000	0.10	1155.17	228.00	0.01
1	180	128.00	1357.20	1366.50		1366.50	0.000001	0.12	1155.17	228.00	0.01
1	180	232.00	1357.20	1366.50		1366.50	0.000003	0.22	1155.17	228.00	0.02
1	60	57.00	1356.20	1366.50	1356.98	1366.50	0.000000	0.05	1383.17	228.00	0.00
1	60	100.00	1356.20	1366.50	1357.33	1366.50	0.000000	0.08	1383.17	228.00	0.01
1	60	128.00	1356.20	1366.50	1357.62	1366.50	0.000000	0.10	1383.17	228.00	0.01
1	60	232.00	1356.20	1366.50	1358.13	1366.50	0.000001	0.18	1383.17	228.00	0.03

HEC-RAS Plan: #2 River: North Ditch Reach: 1

Reach	River Sta		E.G. US (ft)	W.S. US (ft)	E.G. IC (ft)	E.G. OC (ft)	Min Top Rd (ft)	Culv Q (cfs)	Q Weir (cfs)	Delta WS (ft)	Culv Vel In (ft/s)	Culv Vel Out (ft/s)
1	880	Culvert #1	1357.43	1357.00	1358.13	1356.72	1370.00	64.00		0.50	3.25	2.93
1	880	Culvert #1	1357.59	1357.42	1356.94	1357.21	1370.00	95.00		0.92	6.00	5.15
1	880	Culvert #1	1358.27	1357.84	1357.41	1357.76	1370.00	121.00		1.14	7.87	9.79
1	880	Culvert #1	1360.37	1359.31	1358.92	1359.37	1370.30	217.00		2.00	9.50	11.46
[illegible]	100	Culvert #1	1366.50	1366.50	1359.94	1356.50	1364.53	6.39	50.81	0.00	0.17	0.17
[illegible]	100	Culvert #1	1366.50	1365.50	1360.55	1356.50	1364.53	8.02	94.00	0.00	0.21	0.21
[illegible]	100	Culvert #1	1366.50	1366.50	1361.04	1356.50	1364.53	9.06	115.71	0.00	0.24	0.24
[illegible]	100	Culvert #1	1366.51	1366.50	1362.42	1356.51	1364.53	14.94	217.06	0.00	0.40	0.40

HEC-RAS Plan: #1 River: North Ditch Reach: 1

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
1	700	54.00	1365.00	1367.47		1367.47	0.000001	0.08	636.75	290.70	0.01
1	700	95.00	1365.00	1368.04		1368.04	0.000002	0.11	806.32	305.83	0.01
1	700	121.00	1365.00	1368.33		1368.33	0.000002	0.13	895.65	317.42	0.01
1	700	217.00	1365.00	1369.37		1369.37	0.000003	0.17	1234.40	335.56	0.02
1	688	54.00	1364.40	1367.00	1367.00	1367.43	0.005150	5.25	10.29	[illegible]	1.00
1	688	95.00	1364.40	1367.42	1367.42	1367.95	0.004562	6.01	15.79	14.14	1.00
1	688	121.00	1364.40	1367.64	1367.64	1368.27	0.004335	6.36	19.01	15.25	1.00
1	688	217.00	1364.40	1369.31	1368.20	1369.37	0.000259	2.54	222.01	280.59	0.28
1	660	Culvert									
1	647.5	54.00	1364.00	1364.75	1364.75	1364.94	0.026523	3.52	15.38	41.10	1.01
1	647.5	95.00	1364.00	1364.94	1364.94	1365.18	0.023687	3.95	21.05	51.40	1.02
1	647.5	121.00	1364.00	1365.03	1365.03	1365.30	0.022976	4.17	29.30	57.35	1.01
1	647.5	217.00	1364.00	1365.33	1365.31	1365.63	0.019404	4.36	49.72	78.33	0.97
1	527.3	54.00	1362.80	1363.60		1363.65	0.003320	1.41	38.24	97.15	0.38
1	527.3	95.00	1362.80	1363.80		1363.84	0.003477	1.66	57.20	105.82	0.40
1	527.3	121.00	1362.80	1363.89		1363.94	0.003577	1.79	67.77	114.97	0.41
1	527.3	217.00	1362.80	1363.96		1364.09	0.008500	2.86	75.87	121.43	0.64
1	400	54.00	1362.10	1362.60	1362.60	1362.73	0.027565	2.95	18.32	67.71	1.00
1	400	95.00	1362.10	1362.73	1362.73	1362.90	0.026028	3.37	28.18	81.50	1.01
1	400	121.00	1362.10	1362.80	1362.80	1362.99	0.024562	3.63	34.30	89.00	1.00
1	400	217.00	1362.10	1363.49		1363.55	0.002475	1.93	112.70	129.25	0.36
1	200	67.00	1358.40	1360.35	1359.27	1360.43	0.001318	2.10	31.86	18.52	0.28
1	200	118.00	1358.40	1361.12	1359.65	1361.22	0.001347	2.53	46.69	20.61	0.30
1	200	151.00	1358.40	1361.56	1359.87	1361.67	0.001358	2.69	56.20	22.80	0.30
1	200	275.00	1358.40	1363.17	1360.54	1363.22	0.001181	1.80	155.47	142.58	0.27
1	190	Culvert									
1	160	67.00	1357.20	[illegible]		1358.50	0.013300	4.49	14.93	15.28	0.83
1	160	118.00	1357.20	1358.65		1359.07	0.011475	5.21	22.56	17.34	0.80
1	160	151.00	1357.20	1358.96		1359.40	0.009521	5.35	28.22	15.06	0.75
1	160	275.00	1357.20	1360.90		1361.14	0.003521	3.96	69.39	37.90	0.48
1	60	67.00	1356.20	1357.52	1357.07	1357.69	0.005030	3.27	20.48	17.04	0.53
1	60	118.00	1356.20	1358.05	1357.46	1358.29	0.005005	3.96	29.77	18.26	0.50
1	60	151.00	1356.20	1358.57	1357.67	1358.79	0.003503	3.81	39.64	19.47	0.47
1	60	275.00	1356.20	1360.75	1359.34	1360.82	0.002003	2.14	128.48	104.90	0.34

HEC-RAS Plan #1 River: North Ditch Reach 1

Reach	River Sta		E.G. US. (ft)	W.S. US. (ft)	E.G. IC (ft)	E.G. OC (ft)	Min Top Rd (ft)	Culv Q (cfs)	Q Weir (cfs)	Delta WS (ft)	Culv Vel US (ft/s)	Culv Vel DS (ft/s)
1	880	Culvert #1	1367.43	1367.00	1365.11	1366.26	1370.00	64.00		2.25	6.0[illegible]	7.[illegible]
1	880	Culvert #1	1367.98	1367.42	1366.94	1367.26	1370.00	95.00		2.48	7.[illegible]	9.17
1	880	Culvert #1	1368.27	1367.64	1367.41	1367.76	1370.00	121.00		2.60	7.87	9.78
1	880	Culvert #1	1369.37	1369.01	1368.92	1369.37	1370.00	217.00		3.97	9.56	11.46
1	190	Culvert #1	1360.43	1360.36	1360.15	1360.43	1364.53	67.00		2.17	5.74	7.64
1	190	Culvert #1	1361.22	1361.12	1360.90	1361.22	1364.53	118.00		2.48	6.20	6.85
1	190	Culvert #1	1361.68	1361.56	1361.35	1361.68	1364.53	151.00		2.50	7.42	8.45
1	190	Culvert #1	1363.22	1363.17	1363.00	1363.22	1364.53	275.00		2.28	9.59	7.50